32. (Currently Amended) An automation system, comprising at least

a bus,

I/O bus subscribers connected to the bus,

a standard control device,

at least one safety analyzer which is connected to the bus separately by means of an appropriate interface, monitors the data flow via the bus system and is designed to carry out at least one safety-related function,

wherein the safety analyzer is set up for checking and processing safety-related data in the bus datastream and has a device for manipulating the datastream transmitted on the bus and

wherein the safety analyzer is not a logic bus subscriber in the automation system.

33. (Previously presented) The automation system as claimed in claim 32,

wherein the standard control device controls at least one safety-related output.

34. (Previously presented) The automation system as claimed in claim 32,

wherein the safety analyzer has a freely programmable logic device, which processes the monitored safety-related data.

35. (Currently Amended) The automation system as claimed in claim 32,

wherein the safety analyzer ~~is not a logic bus subscriber in the automation system and~~ has at least one safety-related output via which at least one bus subscriber, which is associated with the safety analyzer of the automation system can be switched on or off.

36. (Previously presented) The automation system as claimed in claim 35,

wherein the safety analyzer is set up for switching off at least one of a safety island, a bus spur, and the entire automation system.

37. (Previously presented) The automation system as claimed in claim 32, wherein the safety analyzer has at least one safety-related input, via which the safety analyzer is connected to a safety-related device in the automation system for detecting safety-related data.

38. (Previously presented) The automation system as claimed in claim 32, wherein the bus is connected via an interface assembly to a host, with the process-related control being arranged in the host, and the safety-related control being arranged in the interface assembly.

39. (Previously presented) The automation system as claimed in claim 32, wherein the bus is a serial bus, and at least one safety analyzer is arranged in a long-distance bus section of the automation system.

40. (Previously presented) The automation system as claimed in claim 38, wherein a safety analyzer is one of arranged directly after the host or arranged after the interface assembly.

41. (Previously presented) The automation system as claimed in claim 38, wherein a safety analyzer is arranged in the interface assembly.

42. (Previously presented) The automation system as claimed in claim 32, wherein the safety analyzer comprises a memory device for storing a process map.

43. (Previously presented) The automation system as claimed in claim 32

wherein the safety analyzer has a device for manipulating at least one of input data and output data transmitted on the bus.

44. (Previously presented) The automation system as claimed in claim 43, wherein the device overwrites at least one of the input and output data in the safety analyzer.

45. (Previously presented) The automation system as claimed in claim 43, wherein the device inserts data into the datastream.

46. (Previously presented) The automation system as claimed in claim 32 wherein at least one safety analyzer is of redundant design.

47. (Currently Amended) A method for operating an automation system having a bus, comprising the following steps:

using a standard control device for carrying out a process control with the processing of process-linked I/O data and safety-related data, and

carrying out processing of safety-related data in at least one safety analyzer, which is not a logic bus subscriber in the automation system, with safety-related logic linking data in a ~~the~~ bus datastream being processed in the safety analyzer,

wherein at least one step selected from a group consisting of overwriting at least one data item in the bus datastream, deleting at least one data item in the bus datastream and inserting at least one data item into the bus datastream is performed by the at least one safety analyzer by means of a device for manipulating a ~~the~~ datastream on a ~~the~~ bus.

48. (Previously presented) The method as claimed in claim 47,

further comprising the step of using the standard control device to control at least one safety-related output.

49. (Previously presented) The method as claimed in claim 47, further comprising the step of comparing the safety-related logic linking data, which is transmitted via the bus, for at least one of the standard control device and at least one further safety analyzer with the corresponding logic linking data of the first safety analyzer, in a safety analyzer.

50. (Previously presented) The method as claimed claim 47, further comprising the step of checking the logic linking data, which is produced by the standard control and is sent as output data via the bus in at least one safety analyzer by modeling the safety-related logic links of the standard control.

51. (Previously presented) The method as claimed in claim 49, further comprising carrying out safety-related functions in response to the comparison by the safety analyzer.

52. (Previously presented) The method as claimed in claim 50, further comprising carrying out safety-related functions in response to the checking by the safety analyzer.

53. (Previously presented) The method as claimed in claim 47, further comprising the step of carrying-out a safety-related function via a safety-related output of the safety analyzer.

54. (Previously presented) The method as claimed in claim 47,

further comprising the step of using the safety analyzer to carry out safety-related functions in response to the safety-related data detected via the safety-related input of the safety analyzer.

55. (Previously presented) The method as claimed in claim 54,

wherein the process of carrying out the safety-related function comprises switching a bus subscriber on or off.

56. (Cancelled)

57. (Currently Amended) The method as claimed in claim 47 ~~56~~,

wherein the safety analyzer at least partially stores the monitored datastream and copies input data in the bus datastreams to output data in the bus datastream, and vice versa.

58. (Previously presented) The method as claimed in claim 47,

wherein safety-related data is transmitted via the bus using a security protocol.

59. (Previously presented) The method as claimed in claim 58,

wherein in addition to a safety data item, the security protocol comprises at least one of a negated safety data item, a sequential number, an address and data protection information (CRC).

60. (Previously presented) The method as claimed in claim 47,

wherein the bus is a system operating on the master-slave principle, with data being transmitted between at least two slaves, by means of a data link via at least one safety analyzer, with the safety analyzer copying data in the bus datastream.

61. (Previously presented) The method as claimed in claim 60,

wherein the data is transmitted between individual bus subscribers.

62. (Previously presented) The method as claimed in claim 47,

wherein the bus is a system operating on the master-slave principle, with data being transmitted between at least two slaves by means of a data link via the control or the master, with the control or the master copying data in the bus datastream.

63. (Previously presented) The method as claimed in claim 62,

wherein the data is transmitted between individual bus subscribers.

64. (Previously presented) The method as claimed in claim 47,

wherein at least one of quality data is produced by means of a safety analyzer, and the data which has been read is prepared for further processing.

65. (Previously presented) The method as claimed in of claim 47,

wherein the safety-related logic links used in a safety analyzer are at least partially carried out in redundant form in at least one further safety analyzer, and the same safety functions are at least partially carried out by the two safety analyzers.

66. (Previously presented) The method as claimed in of claim 47,

wherein a safety analyzer also at least partially carries out process data processing.